Clinical Observations

Comparison of the Effects of Traditional Box-Moxibustion and Eletrothermal Bian-Stone Moxibustion on Volume of Blood Flow in the Skin

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Objective: To investigate and compare the effects of Electrothermal Bian-stone moxibustion and traditional box-moxibustion on capillary blood perfusion in the body surface.
Methods: Twenty healthy subjects, 18 females and 2 males, aged averagely 36 years, were enrolled in this experiment. The traditional box-moxibustion and electrothermal Bian-stone moxibustion were respectively given on the hypogastrium around Guanyuan (CV 4), and the changes of local capillary blood perfusion in the body surface were investigated with Laser Doppler Perfusion Imaging (LDPI).
Results: The traditional box-moxibustion was superior to the electrothermal Bian-stone moxibustion in the transient increasing effect in whole body and the long-term increasing effect in the local area of moxibustion on capillary blood perfusion; but for both methods, the increasing effect on the capillary blood perfusion in the local area of moxibustion was same.
Conclusion: Electrothermal Bian-stone moxibustion can not completely take the place of the traditional box-moxibustion; but for some disorders with local pain, they possibly have the same effects.

Keywords: *box-moxibustion; electrothermal Bian-stone moxibustion; LDPI; Guanyuan (CV4); dysmenorrhea*

Box-moxibustion on Qihai (CV 6) and Guanyuan (CV 4) is an effective method for different kinds of diseases with pain in the abdomen, especially for dysmenorrhea of the cold-damp and deficiency-cold types, but because of manipulation limitations in this method, it could not better be applied to the gynecology clinics.[1] In recent years, with the development of Bian-stone therapies and electrothermal techniques, the authors have used the electrothermal Bian-stone moxibustion apparatus produced by Beijing Healthcare Technology Company to treat patients with dysmenorrhea, achieving very good effects.[2] In order to investigate and compare the effects of electrothermal Bian-stone moxibustion and the traditional box-moxibustion on local blood perfusion in the skin, the following experiment was designed.

METHODS

Subjects and Grouping

Twenty healthy subjects from China Academy of Chinese Medical Sciences and Beijing University of Chinese Medicine, 2 males and 18 females, aged 22 to 55 years with a mean of 36, were enrolled in this study. Every subject received both the two kinds of heat stimulation therapies, i.e. eletrothermal Bian-stone moxibustion and traditional box-moxibustion at Guanyuan (CV 6) and Qihai (CV 4) on hypogastrium, with an interval of one day between the two methods (keeping away the menstrual period). Then, the changes of local blood perfusion in the skin were investigated and compared before and after each method.

Experimental Instruments and Methods

The local capillary blood perfusion in the treatment area was detected by Laser Doppler Perfusion Imaging (LDPI, PeriScaf PIM Ⅱ) produced by Sweden PeriMed Company, with a laser wavelength of 670 nm, a normal scanning pattern in high accuracy, a distance about 20 cm from the scanning head to the scanned object (50 × 50 points), and a real scanning area about 12 cm × 12 cm. The Nanyang Wolong Hanyi brand moxa-stick and a specially made wooden box in size of 10 cm × 10 cm; DRB-2E eletrothermal Bian-stone moxibustion apparatus produced by Beijing Healthcare Company, China; B type electrothermal Bian-stone in size of 9 cm × 10 cm with a real surface heating area of 8 cm × 10 cm, temperature

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range 37–53℃, and adjustable accuracy 1℃; and JM222 thermometer produced by Tianjin Liwen Electronics Company, China.

Experimental Procedures

The room temperature of the laboratory was kept at 26℃. All the subjects, after being informed about the procedures and signing the consent, had a rest for 10 min for adaptation to the circumstances and temperature in the laboratory. The area to be detected was exposed, the scanning centre at 4.5 cm below the umbilicus, and the point of Qihai (CV 6) and Guanyuan (CV 4) were marked according to the national standards for The Names & Locations of Channels and Points. After lying down for 5 min, the first graph was scanned with the LDPI device in mage format: 50 × 50, viewed threshold: 6.2 and single mode. Simultaneously, the time, the temperature and humidity of the laboratory, states of the subjects, etc. were recorded.

When the subjects entered the laboratory, the moxa-stick was burned or the eletrothermal Bian-stone apparatus was turned on. After the first graph was scanned, the moxa-box or electrotherm Bian-stone was placed on the subject's hypogastrium with the marked point as the center. The upper edge was placed at the level of umbilicus, and the temperature on the skin surface of the hypogastrium was dynamically observed with the thermometer and changed by regulating the cover of the moxa-box for comfortableness of the subject. The temperature at the moment was recorded and taken as the surface temperature of the electrothermal Bian-stone appartus for this subject in the next experiment. The comfortable temperature was kept for 10 min by opening and closing the cover of the moxa-box or by setting the temperature of the electrothermal Bian-stone apparatus. Instantly after the moxa-box or the the electrothermal Bian-stone apparatus was removed, the second graph was scanned. Ten min later, the third graph was scanned. Each session of the experiment lasted about 40 min.

Statistical Method

The LDPIWin2.5 image processing software provided by Sweden Perimed Company was used. The blood perfusion volumes instantly and 10 min after both methods of moxibustion were compared with that before heat stimulation therpies.

The data were expressed as mean ± standard deviation ($\bar{x} \pm s$). Student's *t*-test was adopted; $P<0.05$ was regarded as a statistically significant difference and $P<0.01$ as a very significant difference.

RESULTS

As shown in the Table 1, the skin capillary blood perfusion volumes instantly after traditional box-moxibustion and eletrothermal Bian-stone moxibustion (Cases=20 in each group) were significantly increased as compared with those before the therapies (both $P<0.01$), and they were significantly decreased 10 min later (both $P<0.01$) but still higher than those before the therapies. It is suggested that the effects of the traditional box-moxibustion and eletrothermal Bian-stone moxi-bustion on skin blood perfusion were almost same; but the decline of blood perfusion was shower after the box-moxibustion therapy ($P<0.01$).

Table 1. Comparison of local skin blood perfusion volumes between the box-moxibustion and the electrothermal Bian-stone moxibstion ($\bar{x} \pm s$, PU)

Item	Cases	Before moxi.	Instantly after moxi.	10 min after moxi.
Traditional box-moxibustion	20	0.52±0.13	1.44±0.35*	0.96±0.24*$^{\Delta}$
Difference (box-moxi.)		-	0.92±0.31	0.44±0.23$^{\#}$
Electrothermal Bian-stone moxibustion	20	0.56±0.13	1.46±0.38*	0.93±0.25*$^{\Delta}$
Difference (Bian-stone)		-	0.90±0.35	0.37±0.24

Notes: Compared with the datum before moxibustion, *$P<0.01$; Compared with the datum instantly after moxibustion, $^{\Delta}P<0.01$; Compared between the box-moxibustion and the Bian-stone moxibustion, $^{\#}P<0.01$.

COMMENT

For quite a long period of time, the box-moxibustion has been seldom used in clinic because of the fumes and smell and the unsafe factors of flaming and burning, though is really has good effects for disorders with pain, especially in the dysmenorrheal of cold type.

The electrothermal Bian-stone apparatus is made by using a special Sibinfu stone with the ultrasound, far-infrared and microcrystal properties, and by using the modern electrothermal and microcomputer temperature control technology. It can offer adjustable and constant temperature, with the effects of warming and activating the channels, dispelling cold and promoting blood flow, indicated for some pain syndromes.[3,4]

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